



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,058	09/06/2005	Christoph Brabec	15626-0048US1/SA-16US	5861
26161	7590	02/22/2010	EXAMINER	
FISH & RICHARDSON PC			MOWLA, GOLAM	
P.O. BOX 1022				
MINNEAPOLIS, MN 55440-1022			ART UNIT	PAPER NUMBER
			1795	
			NOTIFICATION DATE	DELIVERY MODE
			02/22/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	Application No. 10/525,058	Applicant(s) BRABEC ET AL.	
	Examiner GOLAM MOWLA	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6,7,9-16,20-25,27,28,30-51 and 53-56 is/are pending in the application.
- 4a) Of the above claim(s) 54-56 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6,7,9-16,20-25,27,28,30-51 and 53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>01/05/2010 and 02/05/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/05/2010 has been entered.

Election/Restrictions

2. Newly submitted claims 54-56 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

- Newly presented claims 54-55 are directed to a species requiring the first surface of the substrate to have an aperiodic structure, whereas the previously presented claim 28 is directed a distinct species requiring the first surface of the substrate to have a periodic structure.
- Newly presented claim 56 is directed to a species requiring the substrate to comprise TiO₂, whereas the previously presented claims 50-51 and 53 are directed a distinct species requiring the substrate to comprise a polymer such as PET.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for

Art Unit: 1795

prosecution on the merits. Accordingly, claims 54-56 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Response to Amendment

3. Applicant's amendment of 01/05/2010 does not place the Application in condition for allowance.

4. Claims 1, 3, 4, 6, 7, 9-16, 20-25, 27, 28, 30-51 and 53-56 are currently pending. Claims 54-56 withdrawn from consideration as being part of non-elected invention.

Status of the Objections or Rejections

5. The objection to the Specification is withdrawn in view of Applicant's persuasive argument.

6. Due to Applicant's amendment to claims 1, 7, 16, 23, 36, 38 and 40, all rejections from the office Action dated 10/05/2009 are withdrawn. However, upon further consideration, a new ground of rejection is presented below.

Claim Rejections - 35 USC § 103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1, 3-4, 6, 16, 20-21, 23-25, 27-28, 30-31, 33-42, 44, 46-51 and 53 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Fujimori et al. (US 2002/0108649 A1) in view of Saurer et al. (US 5482570) and further in view of Shaheen et al. (WO/2001/084644, refer to US 2003/0159729 A1 for translation).

Art Unit: 1795

Regarding claims 1, 21, 50-51 and 53, Fujimori discloses an organic photovoltaic component (photoelectric conversion device comprising organic compound, see abstract) comprising:

- a polymeric substrate such as PET (2, fig. 2, ¶ 0069 and [0074]) having a first surface and a second surface opposite the first surface,
- a first electrode (first electrode 3, fig. 2, ¶ 0069), the first electrode being closer to the first surface of the substrate than the second surface of the substrate (2),
- an organic semiconductor layer (hole transport layer 5, fig. 2; ¶ 0069, 0104, 0016, 0221, 0223), the first electrode (3) being between the substrate (2) and the organic semiconductor layer (5) (see figure 2), and
- a second electrode (second electrode 6, fig. 2, ¶ 0069), the organic semiconductor layer (5) being between the first (3) and the second (6) electrodes,
 - wherein the substrate (2) is a flexible sheet ([0071] and [0074]), the first electrode (3) has a planar surface ([0076-0083]), and the organic photovoltaic component (5) is configured so that, during use, light passes through the substrate prior to reaching the organic semiconductor layer (5) (see fig. 2 for passage of light, also [0070]).

However, Fujimori does not explicitly disclose whether the first surface of the substrate is structured.

Art Unit: 1795

Saurer teaches a photovoltaic device (photovoltaic cell 1; see fig. 2; col. 3, lines 6-65) wherein the first surface of the substrate (2) is structured (see fig. 2; col. 3, lines 55-62). Saurer utilizes a structured substrate because such use is conventional in the photovoltaic art as it allows for a cell having a relatively large efficacy of light collection by multiple diffusion of the light (col. 4, lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the teachings of Saurer in the photovoltaic component of Fujimori and structure the first surface of the substrate, because such use is conventional in the solar or photovoltaic art as it allows for a cell having a relatively large efficacy of light collection by multiple diffusion of the light, as taught by Saurer.

However, the references are silent as to whether the organic semiconductor layer comprises a conjugated polymer and an acceptor such as a fullerene.

Shaheen discloses an organic photovoltaic component (fig. 1) ([0010-0014]) having an improved short-circuit current ([0003] and [0005]) due to presence of a conjugated polymer and an acceptor such as fullerene ([0011]) in an organic semiconductor layer (photoactive layer 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the conjugated polymer and the acceptor of Shaheen in the organic semiconductor layer of Fujimori in view of Saurer in order to allow for an organic photovoltaic component with increased short-circuit current, as taught by Shaheen.

Regarding claim 3, Fujimori in view of Saurer further discloses that the first electrode (3) is a laminated layer of a comb-teeth like electrode and a transparent

Art Unit: 1795

electrode layer (see [0082]), of which the comb-teeth like electrode reads on instant first electrode, and the transparent electrode layer reads on instant additional layer of which the bottom surface is structured (since the bottom surface of transparent electrode layer is same as the top surface of the substrate, which is structured).

Regarding claims 4 and 42, Fujimori discloses a method of providing an organic photovoltaic cell (photoelectric conversion device comprising organic compound, see abstract) comprising:

- a substrate (2, fig. 2, ¶ 0069) having a first surface and a second surface opposite the first surface,
- a first electrode (first electrode 3, fig. 2, ¶ 0069), the first electrode being closer to the first surface of the substrate than the second surface of the substrate (2),
- an organic semiconductor layer (hole transport layer 5, fig. 2; ¶ 0069, 0104, 0016, 0221, 0223), the first electrode (3) being between the substrate (2) and the organic semiconductor layer (5) (see figure 2), and
- a second electrode (second electrode 6, fig. 2, ¶ 0069), the organic semiconductor layer (5) being between the first (3) and the second (6) electrodes,
 - wherein the substrate (2) is a flexible sheet ([0071] and [0074]), the first electrode (3) has a planar surface ([0076-0083]), and the organic photovoltaic component (5) is configured so that, during use, light passes through the substrate prior to reaching the organic

semiconductor layer (5) (see fig. 2 for passage of light, see also [0070]).

However, Fujimori does not explicitly disclose whether the first surface of the substrate is structured.

Saurer teaches a method of making a photovoltaic device (photovoltaic cell 1; see fig. 2; col. 3, lines 6-65) wherein the first surface of the substrate (2) is structured (see fig. 2; col. 3, lines 55-62). Saurer utilizes a structured substrate because such use is conventional in the photovoltaic art as it allows for a cell having a relatively large efficacy of light collection by multiple diffusion of the light (col. 4, lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the teachings of Saurer in the method of Fujimori and structure the first surface of the substrate, because such use is conventional in the method for providing solar or photovoltaic art as it allows for a cell having a relatively large efficacy of light collection by multiple diffusion of the light, as taught by Saurer.

However, the references are silent as to whether the organic semiconductor layer comprises a conjugated polymer and an acceptor such as a fullerene.

Shaheen discloses a method for providing an organic photovoltaic component (fig. 1) ([0010-0014]) having an improved short-circuit current ([0003] and [0005]) due to presence of a conjugated polymer and an acceptor such as a fullerene ([0011]) in an organic semiconductor layer (photoactive layer 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the conjugated polymer and the acceptor of Shaheen in the

organic semiconductor layer of Fujimori in view of Saurer in order to allow for an organic photovoltaic component with increased short-circuit current, as taught by Shaheen.

Regarding claims 6 and 30, Fujimori in view of Saurer further discloses that the first electrode (3) is a laminated layer of a comb-teeth like electrode and a transparent electrode layer (see [0082]), of which the comb-teeth like electrode reads on instant first electrode, and the transparent electrode layer reads on instant additional layer of which the bottom surface is structured (since the bottom surface of transparent electrode layer is same as the top surface of the substrate, which is structured).

Regarding claims 16, 20 and 44, Fujimori discloses a photovoltaic cell (photoelectric conversion device comprising organic compound, see abstract) comprising:

- a flexible substrate (2, fig. 2, ¶ 0069 and [0074]),
- a first electrode (comb-teeth-like electrode) ([0082]),
- a first layer (transparent electrode, [0082]), the first layer being between the substrate (2) and the first electrode (comb-teeth-like electrode),
- a second layer (barrier layer 8);
- a second electrode (6) (fig. 2, ¶ 0069),
- an organic semiconductor layer (hole transport layer 5, fig. 2; ¶ 0069, 0104, 0016, 0221, 0223) between first (comb-teeth-like electrode) and second (6) electrodes (see figure 2), and
 - wherein the second layer (8) is between the first electrode (comb-teeth-like electrode) and the organic semiconductor (5), the first

Art Unit: 1795

electrode is structured, a surface of the second layer (8) is planar, a surface of the organic semiconductor layer (5) is planar, and the photovoltaic cell is configured so that, during use, light passes through the substrate prior to reaching the organic semiconductor layer (5) (see fig. 2 for passage of light, also [0070]).

However, Fujimori does not explicitly disclose whether the first surface of the substrate is structured.

Saurer teaches a photovoltaic device (photovoltaic cell 1; see fig. 2; col. 3, lines 6-65) wherein the first surface of the substrate (2) is structured (see fig. 2; col. 3, lines 55-62). Saurer utilizes a structured substrate because such use is conventional in the photovoltaic art as it allows for a cell having a relatively large efficacy of light collection by multiple diffusion of the light (col. 4, lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the teachings of Saurer in the photovoltaic component of Fujimori and structure the first surface of the substrate, because such use is conventional in the solar or photovoltaic art as it allows for a cell having a relatively large efficacy of light collection by multiple diffusion of the light, as taught by Saurer.

However, the references are silent as to whether the organic semiconductor layer comprises a conjugated polymer and an acceptor such as a fullerene.

Shaheen discloses an organic photovoltaic component (fig. 1) ([0010-0014]) having an improved short-circuit current ([0003] and [0005]) due to presence of a

Art Unit: 1795

conjugated polymer and an acceptor such as a fullerene ([0011]) in an organic semiconductor layer (photoactive layer 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the conjugated polymer and the acceptor of Shaheen in the organic semiconductor layer of Fujimori in view of Saurer in order to allow for an organic photovoltaic component with increased short-circuit current, as taught by Shaheen.

Therefore, Fujimori in view of Saurer further discloses the bottom surface of the first layer (the transparent electrode layer) is structured (since the bottom surface of transparent electrode layer is same as the top surface of the substrate, which is structured).

Regarding claims 23 and 46, Fujimori discloses a photovoltaic cell (photoelectric conversion device comprising organic compound, see abstract) comprising:

- a polymeric flexible substrate (2, fig. 2, ¶ 0069 and [0074]),
- a support layer (transparent electrode, [0082]) having a surface
- a first electrode (comb-teeth-like electrode) ([0082]), the support layer being between the substrate (2) and the first electrode (comb-teeth-like electrode),
- a second electrode (6) (fig. 2, ¶ 0069),
- an organic semiconductor layer (hole transport layer 5, fig. 2; ¶ 0069, 0104, 0016, 0221, 0223) between first (comb-teeth-like electrode) and second (6) electrodes (see figure 2), and

Art Unit: 1795

- wherein the first electrode (comb-teeth-like electrode) is between the support layer (transparent electrode layer) and the organic semiconductor (5), a surface of the organic semiconductor layer (5) is planar, and the photovoltaic cell is configured so that, during use, light passes through the substrate prior to reaching the organic semiconductor layer (5) (see fig. 2 for passage of light, also [0070]).

However, Fujimori does not explicitly disclose whether a surface of the substrate is structured.

Saurer teaches a photovoltaic device (photovoltaic cell 1; see fig. 2; col. 3, lines 6-65) wherein the first surface of the substrate (2) is structured (see fig. 2; col. 3, lines 55-62). Saurer utilizes a structured substrate because such use is conventional in the photovoltaic art as it allows for a cell having a relatively large efficacy of light collection by multiple diffusion of the light (col. 4, lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the teachings of Saurer in the photovoltaic component of Fujimori and structure the first surface of the substrate, because such use is conventional in the solar or photovoltaic art as it allows for a cell having a relatively large efficacy of light collection by multiple diffusion of the light, as taught by Saurer.

However, the references are silent as to whether the organic semiconductor layer comprises a conjugated polymer and an acceptor such as a fullerene.

Shaheen discloses an organic photovoltaic component (fig. 1) ([0010-0014]) having an improved short-circuit current ([0003] and [0005]) due to presence of a

Art Unit: 1795

conjugated polymer and an acceptor such as a fullerene ([0011]) in an organic semiconductor layer (photoactive layer 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the conjugated polymer and the acceptor of Shaheen in the organic semiconductor layer of Fujimori in view of Saurer in order to allow for an organic photovoltaic component with increased short-circuit current, as taught by Shaheen.

Regarding claims 24-25 and 27, Fujimori in view of Saurer further discloses the top surface of the support layer (transparent electrode layer) is planar, the bottom surface of the support layer (the transparent electrode layer) is structured (since the bottom surface of transparent electrode layer is same as the top surface of the substrate, which is structured), and the top surface of the substrate is structured.

Regarding claims 28, 31 and 33-35, Fujimori in view of Saurer inherently discloses the first surface of the substrate (2) inherently has either a periodic structure or an aperiodic structure, and also the structure surface of the support layer has a periodic structure or an aperiodic structure (since the structured surface of the support layer (transparent electrode layer) is the first surface of the substrate). In addition, the structure of Fujimori in view of Saurer allows for light trapping and enhances photoelectric efficiency as in the case of instant invention. Although the references do not explicitly disclose whether the structure is periodic, instant application fails to provide sufficient evidence as to why the claimed periodic structure is significant. In absence of persuasive evidence that the particular configuration of the claimed periodic structure was significant, it was a matter of choice at the time of the invention which a

Art Unit: 1795

person of ordinary skill in the art would have found obvious (*In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) (MPEP §2144.04 IV(B))).

Regarding claims 36-41 and 47-49, Fujimori discloses an organic photovoltaic component (photoelectric conversion device comprising organic compound, see abstract), or a method of providing an organic photovoltaic component comprising:

- a flexible substrate (2, fig. 2, ¶ 0069 and [0074]) having a first surface and a second surface opposite the first surface,
- a first electrode (first electrode 3, fig. 2, ¶ 0069), the first electrode being closer to the first surface of the substrate than the second surface of the substrate (2),
- an organic semiconductor layer (hole transport layer 5, fig. 2; ¶ 0069, 0104, 0016, 0221, 0223), the first electrode (3) being between the substrate (2) and the organic semiconductor layer (5) (see figure 2), and
- a second electrode (second electrode 6, fig. 2, ¶ 0069), the organic semiconductor layer (5) being between the first (3) and the second (6) electrodes,
 - wherein the substrate (2) is a flexible sheet ([0071] and [0074]), the first electrode (3) has a planar surface ([0076-0083]), and the organic photovoltaic component (5) is configured so that, during use, light passes through the substrate prior to reaching the organic semiconductor layer (5) (see fig. 2 for passage of light, also [0070]).

Art Unit: 1795

However, Fujimori does not explicitly disclose whether the first surface of the substrate is structured.

Saurer teaches a photovoltaic device (photovoltaic cell 1; see fig. 2; col. 3, lines 6-65) wherein the first surface of the substrate (2) is structured (see fig. 2; col. 3, lines 55-62). Saurer utilizes a structured substrate because such use is conventional in the photovoltaic art as it allows for a cell having a relatively large efficacy of light collection by multiple diffusion of the light (col. 4, lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the teachings of Saurer in the photovoltaic component of Fujimori and structure the first surface of the substrate, because such use is conventional in the solar or photovoltaic art as it allows for a cell having a relatively large efficacy of light collection by multiple diffusion of the light, as taught by Saurer.

However, the references are silent as to whether the organic semiconductor layer comprises a conjugated polymer and an acceptor such as a fullerene.

Shaheen discloses an organic photovoltaic component (fig. 1) ([0010-0014]) having an improved short-circuit current ([0003] and [0005]) due to presence of a conjugated polymer and an acceptor such as a fullerene ([0011]) in an organic semiconductor layer (photoactive layer 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the conjugated polymer and the acceptor of Shaheen in the organic semiconductor layer of Fujimori in view of Saurer in order to allow for an organic photovoltaic component with increased short-circuit current, as taught by Shaheen.

Art Unit: 1795

Fujimori in view of Saurer inherently discloses the first surface of the substrate (2) inherently has either a periodic structure or an aperiodic structure, and also the structure surface of the support layer has a periodic structure or an aperiodic structure (since the structured surface of the support layer (transparent electrode layer) is the first surface of the substrate). In addition, the structure of Fujimori in view of Saurer allows for light trapping and enhances photoelectric efficiency as in the case of instant invention. Although the references do not explicitly disclose whether the structure is periodic, instant application fails to provide sufficient evidence as to why the claimed periodic structure is significant. In absence of persuasive evidence that the particular configuration of the claimed periodic structure was significant, it was a matter of choice at the time of the invention which a person of ordinary skill in the art would have found obvious (*In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) (MPEP §2144.04 IV(B))).

9. Claims 7, 9-15, 22 and 32 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Fujimori et al. (US 2002/0108649 A1) in view of Saurer et al. (US 5482570)

Regarding claim 7, Fujimori discloses a photovoltaic cell (photoelectric conversion device comprising organic compound, see abstract) comprising:

- a substrate (2, fig. 2, ¶ 0069) having a first surface and a second surface opposite the first surface,

Art Unit: 1795

- a first electrode (first electrode 3, fig. 2, ¶ 0069), the first electrode being closer to the first surface of the substrate than the second surface of the substrate (2),
- an organic semiconductor layer (hole transport layer 5, fig. 2; ¶ 0069, 0104, 0016, 0221, 0223), the first electrode (3) being between the substrate (2) and the organic semiconductor layer (5) (see figure 2), and
- a second electrode (second electrode 6, fig. 2, ¶ 0069), the organic semiconductor layer (5) being between the first (3) and the second (6) electrodes,
 - wherein the substrate (2) is a flexible sheet ([0071] and [0074]), the first electrode (3) has a planar surface ([0076-0083]), and the organic photovoltaic component (5) is configured so that, during use, light passes through the substrate prior to reaching the organic semiconductor layer (5) (see fig. 2 for passage of light, also [0070]).

However, Fujimori does not explicitly disclose whether the first surface of the substrate is structured.

Saurer teaches a photovoltaic device (photovoltaic cell 1; see fig. 2; col. 3, lines 6-65) wherein the first surface of the substrate (2) is structured (see fig. 2; col. 3, lines 55-62). Saurer utilizes a structured substrate because such use is conventional in the photovoltaic art as it allows for a cell having a relatively large efficacy of light collection by multiple diffusion of the light (col. 4, lines 1-5).

Art Unit: 1795

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the teachings of Saurer in the photovoltaic component of Fujimori and structure the first surface of the substrate, because such use is conventional in the solar or photovoltaic art as it allows for a cell having a relatively large efficacy of light collection by multiple diffusion of the light, as taught by Saurer.

Regarding claim 9, Fujimori further discloses that a surface of the organic semiconductor is planar (see fig.2 for configuration).

Regarding claim 10, Fujimori further discloses that the first electrode (3) is disposed on the first surface of the substrate (2) (see fig. 2).

Regarding claim 11, Fujimori further discloses that the first electrode (3) is a cathode ([0077]).

Regarding claims 12 and 13, Fujimori in view of Saurer further discloses that the first electrode (3) is a laminated layer of a comb-teeth like electrode and a transparent electrode layer (see [0082]), of which the comb-teeth like electrode reads on instant first electrode, and the transparent electrode layer reads on instant additional layer of which the bottom surface is structured (since the bottom surface of transparent electrode layer is same as the top surface of the substrate, which is structured) and the top surface is planar on which the first electrode (comb-teeth like electrode) is formed.

Regarding claim 14, Fujimori further discloses a planarized layer (barrier layer 8, ¶ 0069; see fig. 7 that shows the barrier layer is planarized) between the organic semiconductor (5) and the first electrode (3).

Regarding claim 15, Fujimori further discloses that the first electrode (3) is disposed on the substrate (2) (see fig. 2).

Regarding claim 22, Fujimori further discloses that the first electrode (comb-teeth like electrode) has a structured surface.

Regarding claim 32, Fujimori in view of Saurer inherently discloses the first surface of the substrate (2) inherently has either a periodic structure or an aperiodic structure. In addition, the structure of Fujimori in view of Saurer allows for light trapping and enhances photoelectric efficiency as in the case of instant invention. Although the references do not explicitly disclose whether the structure is periodic, instant application fails to provide sufficient evidence as to why the claimed periodic structure is significant. In absence of persuasive evidence that the particular configuration of the claimed periodic structure was significant, it was a matter of choice at the time of the invention which a person of ordinary skill in the art would have found obvious (*In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) (MPEP §2144.04 IV(B))).

10. Claims 43 and 45 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Fujimori et al. (US 2002/0108649 A1) in view of Saurer et al. (US 5482570) as applied to claim 7 above, and further in view of Shaheen et al. (WO/2001/084644, refer to US 2003/0159729 A1 for translation)

Regarding claims 43 and 45, Applicant is directed above for complete discussion of Fujimori in view of Saurer with respect to claim 7, which is incorporated herein. However, the references are silent as to whether the organic semiconductor layer comprises a conjugated polymer and an acceptor such as a fullerene.

Shaheen discloses an organic photovoltaic component (fig. 1) ([0010-0014]) having an improved short-circuit current ([0003] and [0005]) due to presence of a conjugated polymer and an acceptor such as fullerene ([0011]) in an organic semiconductor layer (photoactive layer 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the conjugated polymer and the acceptor of Shaheen in the organic semiconductor layer of Fujimori in view of Saurer in order to allow for an organic photovoltaic component with increased short-circuit current, as taught by Shaheen.

Response to Arguments

11. Applicant's arguments with respect to claims 1, 3, 4, 6, 7, 9-16, 20-25, 27, 28, 30-51 and 53 have been considered but are moot in view of the new ground(s) of rejection as necessitated by the amendments.

Applicant argues that the prior art of record alone or in combination fails to disclose "a photovoltaic component or cell that includes a flexible, structured substrate and a semiconductor", wherein "the photovoltaic component or cell is configured so that, during use, passes through the flexible, structured substrate prior to reaching the organic semiconductor" (see Remarks, page 2).

This argument is directed to the claim as amended and is moot in view of new ground of rejection as presented above.

Correspondence/Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GOLAM MOWLA whose telephone number is (571) 270-5268. The examiner can normally be reached on M-Th, 0800-1800 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ALEXA NECKEL can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. M./
Examiner, Art Unit 1795

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795

Application/Control Number: 10/525,058
Art Unit: 1795

Page 21